



Sustainable Archaeology Animation Unit (SAAU) Creates Digital Archives of Large Archaeological Collections with the HDI Advance 3D Scanners

Sustainable Archaeology, and its Sustainable Archaeology Animation Unit (SAAU), has taken innovative steps to make Ontario's archaeological records accessible to researchers, students, and the public without stepping into a museum or storage facility. Sustainable Archaeology is a research initiative at Western University funded by the Canadian Foundation for Innovation and Ontario Ministry of Research and Innovation. The SAAU, the first animation studio dedicated to archaeology, was established as a joint collaboration between Sustainable Archaeology, the Museum of Ontario Archaeology, and theskonkworks Inc. Its mandate is to combine three-dimensional (3D) artifact digitization and computer generated imagery (CGI) to achieve the long term preservation and digital archiving of Ontario's archaeological heritage. The Animation Unit received funding from the Ontario Museums Technology Fund and a MITACS Accelerate Internship award.

One of the most important aspects of the SAAU is their commitment to accuracy and completeness when virtually reconstructing archaeological sites and artifacts. Sustainable Archaeology had contacted 3D3 Solutions to propose 3D scanning solutions that would allow for the digitization of large archaeological collections quickly and accurately. The system had to be able to handle large volumes of artifacts that range in different shapes and sizes, as well as encapsulate the true likeness of the artifacts with high resolution color and texture capture.

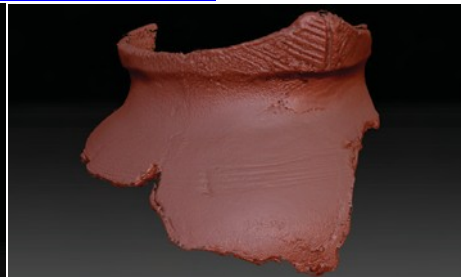
Assembly Line Workflow to 3D Scanning

3D3 Solutions collaborated with Sustainable Archaeology's SAAU personnel to perfect an assembly line workflow to 3D scanning based on four HDI Advance3D Scanners. The HDI Advance 3D Scanner is an affordable system that offers fast 3D scanning without compromising on quality.

The scanner captures accurate 3D scans from physical objects in seconds with 3D3 Solution's proprietary scanning software, FlexScan3D, which is included with each scanner. The software also provides basic post-processing capabilities that merges and aligns 3D scans into a digital 3D model.

The HDI Advance 3D Scanner is a flexible system that is capable of scanning objects of different shapes and sizes simply by changing the scanner's field of view (FOV). The FOV is the observable area that the system is able to capture from a specific distance. Each HDI Advance 3D Scanner is set to scan at a specific field of view (FOV) to handle artifacts more efficiently.

http://www.youtube.com/watch?v=tZuQUyHKbK4&feature=player_embedded

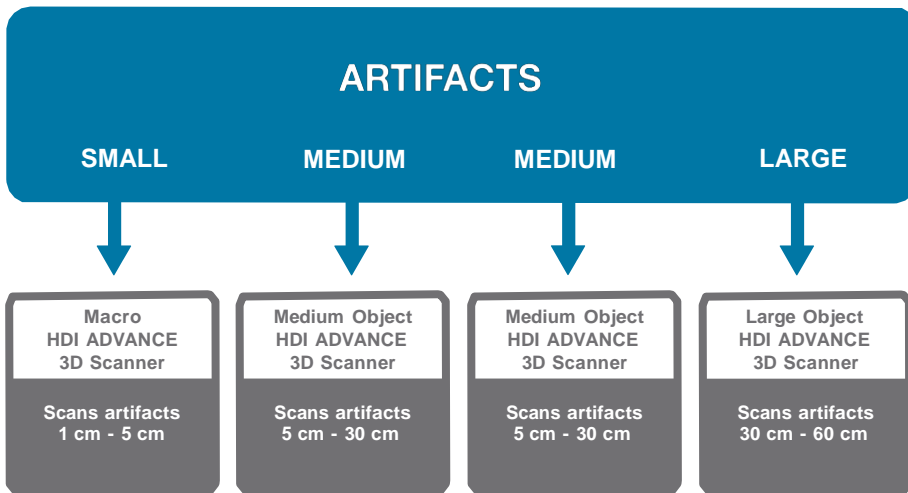


Digital artifact produced by the HDI Advance 3D Scanner. Click on the YouTube icon for a video of the 3D model in 360 degrees

WEB www.scope3d.net

“With the assembly line approach to 3D scanning we are able to scan an artifact in about 30 minutes which cuts down a considerable amount of time for us. This is very important factor when there is a large collection of artifacts to scan.”

Namir Ahmed
SAAU Project Co-ordinator



Due to the volume of artifacts that needs to be digitized, each scanner is geared towards scanning artifacts of a specific size to speed up the 3D scanning process.

The Macro HDI Advance 3D Scanner is customized to scan very small objects that range from 1 cm to 5 cm while still capturing an intense level of detail. Two HDI Advance 3D Scanners are set up as medium object scanners that scan artifacts ranging from 5 cm to 30 cm in size. The fourth scanner is dedicated to scanning artifacts that range from 30 cm to 60 cm.

“We’re very impressed by the results produced by the HDI Advance 3D scanning systems. From talking to other researchers and from our past experiences, we find that other 3D scanners normally take a couple of hours to scan one artifact,” said Namir Ahmed, SAAU Project Co-ordinator. “With the assembly line approach to 3D scanning we are able to scan an artifact in about 30 minutes which cuts down a considerable amount of time for us. This is very important factor when there is a large collection of artifacts to scan.”

Currently the scanners are configured to scan artifacts according to Sustainable Archaeology’s current needs. If those needs change over time, the SAAU can reconfigure the scanners to match new requirements without purchasing a completely new system.

Capturing the True Likeness of Artifacts

When viewing the digitized artifact as a scalable model that can be rotated in 360 degrees, one can view the level of detail that this artifact was manufactured. The ability to add high resolution color and texture to the 3D model allows for the creation of truly life-like digital versions of the original artifact.



The image below (left) is a 3D scan of a small projectile point approximately 5 cm in size that was scanned with the Macro HDI Advance 3D Scanner. The image (right) is the same point with original coloring and texture of the stone added to the 3D scan. The scanner captures the precise shape of the artifact in 3D in addition to the color and texture of the surfaces.

Next Steps

The next step for Sustainable Archaeology and the SAAU is to continue to build its digital archive of artifacts housed in its repository. The ultimate aim of Sustainable Archaeology is to make these images, along with the numerous other datasets that make up the record of archaeological fieldwork, available online for the thousands of sites that will be brought into the facility. Making these records and images accessible will allow researchers, students, Descendant groups and the public access to the first ever fully digitized record of the complete archaeological heritage from a region of the world. For more information about Sustainable Archaeology and the efforts of the SAAU, please visit <http://sustainablearchaeologyuwo.blogspot.ca/> and <http://saanimation.wordpress.com/>.